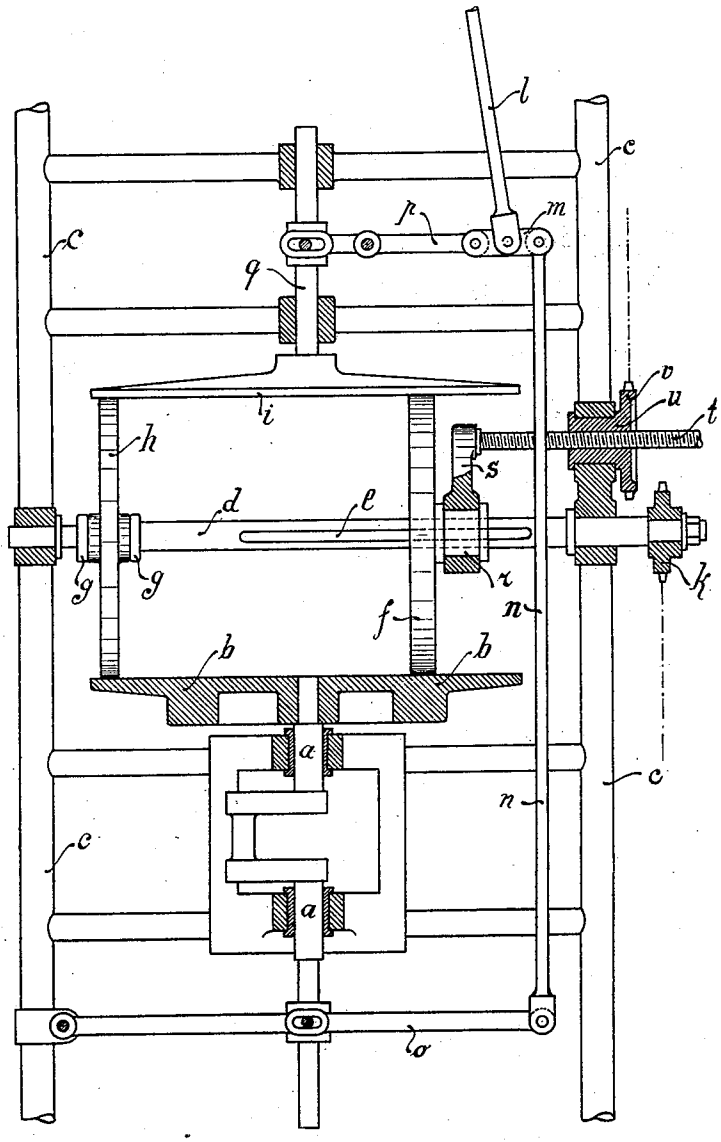
No. 730,678. PATENTED JUNE 9, 1903.

L. MAURER.

FRICTION GEARING.

APPLICATION FILED MAY 15, 1902.

NO MODEL.



Attest:
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No. 730,678. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

LUDWIG MAURER, OF NUREMBERG, GERMANY, ASSIGNOR TO NÜRNBERGER MOTORFAHRZENGE FABRIK UNION, G. M. B. H., OF NUREMBERG, BAVARIA, GERMANY.

FRICTION-GEARING.

SPECIFICATION forming part of Letters Patent No. 730,678, dated June 9, 1903.

Application filed May 15, 1902. Serial No. 107,446. (No model.)

To all whom it may concern:

Be it known that I, LUDWIG MAURER, a subject of the Emperor of Germany, and a resident of Nuremberg, Bavaria, Germany, have invented certain new and useful Improvements in Friction-Gearing, of which the following is a specification.

A double flat-disk friction-wheel gearing in which two friction-wheels are compressed between two opposed friction-disks is already known. The double flat-disk friction-wheel gearing which forms the object of the present invention has, however, many advantages over those already known.

In the improved double flat-disk friction-wheel gearing which forms the object of the present application only one of the flat disks is driven from the motor, and the change of gear is effected by the displacement of only one of the friction-wheels, whereby the whole gearing is considerably simplified and the force necessary for adjusting the friction-wheel is rendered comparatively light in spite of the double driving of the latter. The following arrangement, one form of construction of which is shown in the accompanying drawing, is adopted for obtaining this action.

In the drawing the figure is a sectional plan view.

A flat disk *b* is fixed on the inner end of a motor crank-shaft *a*. In front of this disk and parallel to it a shaft *d* is mounted on the car-frame *c*, which shaft is to be driven with a variable speed and on which shaft a friction-wheel *f* is longitudinally adjustably mounted by means of a key engaging in a groove *e*. On the same shaft a friction-wheel *h* is revolubly mounted between set rings or collars *g*, which wheel, like the friction-wheel *f*, is in contact with the flat disk *b*. On the other side of the shaft *d* a second flat disk *i* is revolubly mounted opposite the first-named flat disk *b* and bearing with its friction-surface also on the peripheries of the friction-wheels *f* and *h*. While the friction-wheel is, as already stated, axially adjustable between the two flat disks *b* and *i*, the friction-wheel *h*, which is immovably mounted and faces the friction-wheel *f*, is always at the outer end of the flat disks.

The rotation imparted by the motor to the flat disk *b* is transmitted directly to the adjustable friction-wheel *f* and also, by means of the non-adjustable friction-wheel *h*, to the flat disk *i*, which imparts this rotation also to the friction-wheel *f*. As both flat disks *b* and *i* always rotate at a similar speed, but in opposite directions, the adjustable friction-wheel *f*, clamped between the two disks, is driven at two diametrically opposite points uniformly and in similar directions of rotation, so that also even in the case of low gears—that is to say, when the friction-wheel *f* approaches the center of the flat disks—the transmission of movement to the shaft *d* to be driven takes place with certainty. According to the position of the friction-wheel *f* between the disks the shaft *d* transmits the motion of the motor-shaft *a* by means of chain-wheel gear *k* or the like with a greater or smaller speed of transmission to the driving-axle of the vehicle.

The two flat disks *b* and *i* may be pressed against the friction-wheels *f* and *h* from the driver's seat by pulling a rod *l*, which acts by means of link-bars *m* and *n* on the one hand on the end of a lever *o* and on the other hand on the end of a lever *p*. The lever *o* engages with a collar or the like on the motor-shaft *a*, and the double lever *p* similarly acts upon the rotary axle *q* of the disk *i* in such a way that when the rod *l* is drawn back the shaft *a* and the axle *q* are pushed inward, and consequently the flat disks *b* and *i* are pressed against the peripheries of the friction-wheels *f* and *h*, while when the pull on the rod *l* ceases the pressure ceases, and thus the transmission of movement is interrupted.

The axial displacement of the friction-wheel *f* may also be effected by means of an arm *s* pivotally engaging the hub *r* of the friction-wheel, which arm *s* is firmly connected with a screw-spindle *t*. On this screw-spindle a nut *u* is seated, which is revolubly mounted on the car-frame *c*, and which nut may be rotated from the driver's seat—for

instance, by means of chain-wheel gearing *v*—in such a way that thus the spindle *t* may be screwed inward or outward, and thus the friction-wheel *f* suitably adjusted and the gear altered as required.

I declare that what I claim is—

In combination, a motor or driving shaft, a friction-disk on the end thereof, a second disk journaled with its face parallel with said first-named disk, a shaft arranged between and parallel to said disks, a friction-wheel fast on said shaft and having its periphery rotating in contact with both said disks, a second wheel splined on said shaft and having its periphery in contact with the faces of both said disks, and means for moving said second wheel on the shaft and means for moving the disks into and out of contact with the wheels, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

LUDWIG MAURER.

Witnesses:
ANDREAS STICH,
OSCAR BOCK.